THE MINERAL INDUSTRY OF

TANZANIA

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Currently, agriculture is the most important sector of Tanzania's economy, employing more than 80% of the country's workforce and accounting for more than 50% of the gross domestic product and 85% of exports. However, encouraged by more aggressive Government investment policies, and the exploration successes reported in 1996, mining is on the verge of becoming a significant part of the Tanzanian economy. Although the country's natural resources include coal, cobalt, diamond, gemstones, graphite, iron ore, natural gas, nickel, and phosphate rock, gold will be the dominant mineral commodity in the future. The four most advanced gold projects reported a combined resource of 327,000 kilograms (kg) of gold by yearend 1996, with substantial potential for additions to this amount. At a gold price of $300 per troy ounce ($9,645 per kilogram), this resource has a gross in-place value of over $3 billion.

Administration of the mining sector is the responsibility of the Ministry of Water, Energy and Minerals under the Mining Act of 1979. Investment in the petroleum sectors was governed by the provisions of the 1980 Petroleum (Exploration and Production) Act. The Mining Law of 1979 has been modified by the Policy Issue Papers of 1983, which proposed the mineral wealth of Tanzania as the nation's heritage and gave the state majority ownership in mining activities. However, the Model Agreement of 1988 removed the Government majority ownership requirement. The incorporation of 1988 minerals trade policies into the 1979 Act and the establishment of the National Investment Promotion Center (IPC) helped to create a favorable environment for foreign investment. Prospectors must obtain exploration and development licenses through the IPC. Reconnaissance Licenses were issued for a period of 1 year and could be renewed once. These cover specific areas and minerals. Prospecting Licenses are issued for 3 years and are renewable up to 4 years depending on work performance. Mining licenses, when issued, give exclusive rights to investors to prospect, produce, and sell the minerals recovered. The mining licenses expire after 25 years or at the end of the estimated life of the deposit, whichever was shorter, and were renewable for another 15 years. The Government was currently reviewing the Mining Act and was to propose new legislation by 1998.

Since the early 1990's, the Government of Tanzania has attempted to improve the country's attractiveness to the international investment community with the 1990 National Investment Promotion Act and the creation of the IPC. The country has been successful in attracting mineral exploration and investment and has triggered a "gold rush" in the greenstone belts at the southern end of Lake Victoria. Exploration companies from Australia, Canada, South Africa, Sweden, and the United Kingdom have been very active in Tanzania since 1993 and 1994.

The 1979 Mining Act required that prospectors provide environmental statements with applications for permits before a license was issued. The National Environment Management Act of 1983 covered environmental matters and authorized a National Environmental Council to regulate environmental activities. Mining is not permitted in National Parks or in the Ngorongoro Conservation area but is allowed by special permits in game reserves.

Historically, diamonds and gold have been the most important minerals produced in Tanzania. Tanzania also produces construction materials, including cement and other industrial minerals. Fuel mineral production in Tanzania has been limited to coal and a small amount of petroleum refinery products. In 1996, production of gold, salt, and tin declined. However, large increases were observed in the production of coal, diamonds, precious and semiprecious gemstones, and graphite. (*See table 1.)*

Some of the impediments to Tanzania's developing its mineral industry include its poor infrastructure and lack of energy.

During the year, gold exploration and development planning dominated the industry news, with several companies announcing the discovery of significant gold resources.

For $25 million, Resolute Samantha Ltd. of Australia, now called Resolute Ltd., acquired a 50% interest in the Golden Pride gold prospect held by Samax Resources Ltd. of the United Kingdom. It will be the first of the new gold deposits to be developed. The Golden Pride resource was reported as proven and probable reserves of 13.5 million metric tons (Mt) grading 3.2 grams per ton (g/t) and a total reserve plus resource of 25.7 Mt grading 3.09 g/t for a total resource of 79,450 kg of contained gold (RBC Dominion Securities, 1997). In early February 1997, the Tanzanian Government granted a formal mining license to Resolute to develop a 2 million-ton-per-year (Mt/yr) mining and carbon-in-leach/carbon-in-pulp processing operation expected to produce over 5,600 kg of gold per year at a cost of $242 million (Resolute Ltd. 1997a,b). Construction was to start in March 1997 with commissioning scheduled for the first quarter of 1998.

The Bulyanhulu gold prospect of Sutton Resources Ltd. (Sutton), of Canada was the largest resource declination to date. Calculations based on drilling to December 31, 1996, increased the total identified gold resource to 10.5 Mt grading 14.92 g/t

containing nearly 157 tons of gold. The estimate for Bulyanhulu Reef 1 included 1.39 Mt of measured resource grading 17.28 g/t; 5.37 Mt of indicated resource grading 15.67 g/t; and 3.04 Mt of inferred resource grading 13.29 g/t. The inferred resource at the Bulyanhulu Reef 2 was reported at 0.7 Mt grading 15.67 g/t. Underground development work was proceeding concurrently with exploration and would be used as a basis for a full feasibility study to be completed in early 1998. The initial production target anticipated processing 1,500 tons per day to produce up to 7,800 kilograms per year of gold (Sutton Resources Ltd., 1997c).

Randgold Resources Tanzania, a joint venture between Randgold Resources of South Africa and Pangea Goldfields Inc. (Canada) was formed in September 1995 to explore the Golden Ridge project, which covers three adjacent areas of about 174 square kilometers in Lake Victoria gold fields, northwest Tanzania. Randgold has full management of the project and subject to expending $5 million on the project, completing a bankable feasibility study, and arranging project financing, could earn a 65% equity interest in the property. A prefeasibility study is expected to be completed on the project by July 1997. Rangold's 1996 exploration outlined three zones containing a total measured and indicated resource to 100 meters depth of nearly 50,000 kg of gold. The main resources at Golden Ridge were contained in two areas, Nyaligongo with 10.2 Mt grading 2.44 g/t and Hill 5 with 2.2 Mt grading 3.02 g/t (Pangea Goldfields Inc., 1997a). Pangea also held the rights to a number of other prospective gold properties, including joint ventures with Anglo American Corp. of South Africa on the Kahama/Chocolate Reef property where a resource of 10 Mt at 2.0 g/t containing 20,000 kg of gold had been identified to-date, and with Ashanti Goldfields Company. Ltd. (Ashanti) of Ghana on the Bulyanhulu South and Rubondo properties (Pangea Goldfields Inc., 1997b).

In early 1996, Ashanti acquired an 85% interest in the old Geita gold mine and adjacent exploration property in the Lake Victory Gold Belt through the acquisition of Cluff Resources plc. of the United Kingdom. Ashanti's exploration program focused on a 4-kilometer long northwest extension of the Lone Cone-Geita banded ironstone ridge (BIF) where drilling identified an indicated and inferred resource of 12 Mt grading 3.44 g/t, equivalent to 40,400 kg of gold. Fill in drilling will be done in 1997 with a feasibility study on the open pit potential of Geita to begin during the second-half of 1997 (Ashanti Goldfields Company Ltd., 1997).

In addition, East African Gold Corp., Princess Resources Ltd., Patrician Gold Mines in joint venture with JCI Ltd. of South Africa (which terminated in mid-1996), Tan Range, Serengeti Diamonds Ltd., and International Gold Exploration AB were also exploring for gold in Tanzania. East African Gold reported the identification of surface laterite and ironstone mineralization of 875,000 metric tons (t) gold at its Kitongo property with exploration continuing (East Africa Gold, 1996).

During the year, Sutton continued work in its two nickel-cobalt joint-venture projects with BHP Minerals International Exploration Inc., the Kabanga and the Kagera, in northwest Tanzania. Sutton reported total inferred resources at the Kabanga deposit of 31 Mt grading 1.5% nickel and 0.13% cobalt (Sutton Resources Ltd., 1997a). In early January 1997, BHP relinquished its interest in the Kabanga property, while obtaining a right to earn a 35% interest in the North Kagera nickel project, contingent on expenditures of $5 million. If a bankable feasibility study is completed, BHP's working interest will increase to 77.5% (Sutton Resources Ltd., 1997b). In a separate nickel market analysis, AME Mineral Economics of Australia indicated that the development of the very large Voisey's Bay nickel project in Labrador may lead to the delay or abandonment of marginal nickel projects such as in Kabanga, Tanzania, and in the Cote d'Ivoire (African Energy & Mining, 1996).

Other mineral production focused on diamonds, gemstones, and graphite. Williamson Diamonds Ltd., following an $8 million modernization, increased diamond production in 1996 to 117,000 carats from the Williamson (Mwadui) Mine. The company is owned 75% by De Beers Centenary Ag. and 25% by the State Mining Corp. Additional diamond exploration was being conducted by Reunion Mining of the United Kingdom at Mabuki while Serengeti Diamonds Ltd. of Canada, acquired an 80% interest in the Kahama diamond mining claim in 1995 from a local company, Tanzania Diamond Mines, which was verifying the resource potential of the property which had been estimated at some 400,000 carats. Serengeti also planned to commission a 50 ton-per-hour diamond processing plant at Kahama.

In 1996, SAMAX Ltd. of the United Kingdom transferred its management of the Graphtan Ltd. graphite mine, near Merelani, north Tanzania to Phoenix Minerals Ltd. The $20 million mine which began production in 1995, produced 6,776 t of graphite in its first full year of production in 1996.

In the energy sector, Tullow Oil of Ireland began evaluation of the offshore Mnazi Bay natural gas field; the Ocelot Energy Ltd. and Trans Canada Pipelines Ltd. Canadian joint venture, under contract to the Government, began development of the $300 million Songo Songo offshore gas production and processing project to deliver gas to a Dar es Salaam power station in 1998; and the World Bank was financing a $44 million rehabilitation of the Tazama oil pipeline from Dar es Salaam, Tanzania, to the Copperbelt in Ndola, Zambia.

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Major Sources of Information

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TABLE 1
TANZANIA: PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Metric tons unless otherwise specified)

Commodity 3/		1992	1993	1994	1995	1996 e/
Calcite		1,570	180	540	37	37
Cement, hydraulic e/		540,000	540,000	490,000 r/	800,000 r/	800,000
Clays:						
Bentonite e/		70	70	70	70	75
Kaolin		1,360	-- e/	541 r/	596 r/	1,332 4/
Coal, bituminous		71,121	51,270	45,000 r/	43,200 r/	52,000 4/
Diamond 5/	carats	67,304	40,847	17,177 r/	49,538	126,670 4/
Gemstones, precious and semiprecious excluding diamond	kilograms	48,938	34,826	48,509 r/	111,403 r/	142,160 4/
Gold, refined	do.	3,201	3,264	2,861 r/	320 r/	318 4/
Graphite		--	--	--	359	6,776 4/
Gypsum and anhydrite, crude		27,063	1,205	7,536	1,052	8,765 4/
Lime, calcined and hydrated		1,806	356	101	-- e/	--
Limestone, crushed		990,480	527,120	648,474	1,062,081	120,000 4/
Mica, sheet		(6/)	(6/)	(6/)	(6/)	(6/)
Petroleum refinery products: e/						
Liquefied petroleum gas	thousand 42-gallon barrels	33 4/	30	30	30	30
Gasoline	do.	855 4/	850	850	850	850
Kerosene	do.	432 4/	400	400	400	400
Jet fuel	do.	262 4/	250	250	250	250
Distillate fuel oil	do.	820 4/	800	800	800	800
Residual fuel oil	do.	1,562 4/	1,500	1,500	1,500	1,500
Other	do.	450 4/	450	450	450	450
Total including refinery fuel and losses	do.	4,414 4/	4,280	4,280	4,280	4,280
Phosphate minerals:						
Apatite e/		16,000	11,400	--	--	3,380 4/
P_2O_5 content 7/		4,948	3,541	--	6,686 r/	717 4/
Salt, all types		78,419	17,740	84,289 r/	105,000 r/	86,700 4/
Sand, glass e/		4,200	4,200	4,200	4,200	4,200
Soda ash e/		300	300	300	300	300
Tin, mine output, Sn content		8	12	9 r/	3 r/	--

e/ Estimated. r/ Revised.

1/ Includes data available through March 11, 1998.

2/ Estimated data are rounded to three significant digits.

3/ In addition to the commodities listed, modest quantities of unlisted varieties of crude construction materials (other clays, sand and gravel, and stone) presumably are produced, but output is not reported quantitatively, and available information is inadequate to make reliable estimates of output levels.

4/ Reported figure.

5/ Diamond figures are estimated to represent 70% gem-quality or semigem-quality and 30% industrial-quality stones.

6/ Less than 1/2 unit.

7/ P_2O_5 figures are reported and represent 31% of estimated apatite ($Ca_5Cl(PO_4)_3$) output. Consideration is given for impurities.